



## The Technique of Using Brick or Tile Decorations on the Walls of Historical Monuments in Samarkand

Urokov Olimjon Khayitboevich

Doctor of Philosophy in Architecture, Samarkand State  
University of Architecture and Construction named after Mirzo Ulugbek

Received 4<sup>th</sup> Sep 2023, Accepted 6<sup>th</sup> Oct 2023, Online 30<sup>th</sup> Nov 2023

**Abstract:** The architectural features found in historical monuments, as well as the techniques used to create wall decorations such as tiling or brickwork, as well as the solutions for dandona, tahbin, tile, brickwork, preparing passagers, Ravak, lingazarba, dome, peshtoq, and Persian style solutions, are all visible in the structures.

**Keywords:** denta, tahbin, kashin, brickwork, pakh preparation, porch, lingazarba, dome, peshtoq, Persian style, gypsum, decorative technology, construction.

**Introduction:** The ornamental kind of architectural embellishment utilized in monuments and bricks, primarily in tiling projects, is called architecture. A row of glazed or unglazed bricks is put as a border for the ornamental tiling or brickwork on the walls of ancient sites. These kinds of tiles or bricks are known as dandona.

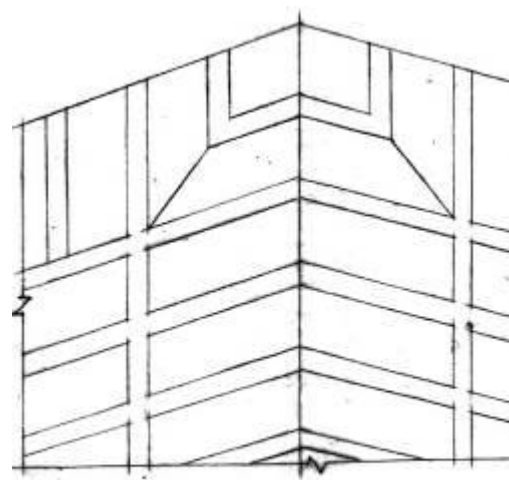
Bricks chosen in the Dandona style are also used to finish the last upper corner of the wall tiles or brick work.

Teeth can be classified as either straight or angular based on their structure. A tooth that is straight has one side, while a tooth that is angular has two sides and a 90° angle. When a tooth wraps around the tiles on the right wall or in the building's inner corner, it is utilized on both sides in the building's outer corners.

Chamfers with an obtuse angle (angle larger than 90°) are used in some polygonal (8-angled) structures, polygonal columns, and pool wall external corners. (Source: )

Semicircular grooves on one side are also utilized in brickwork. The entryway to the eleventh-century minaret in the Shokhi Zinda complex serves as an illustration of this.

**1.1. Preparation and brushing of teeth** Linear gear 5x5 cm, 4.5x4.5 cm, and comparable. It is available in sizes 5x10 cm, 4x8 and 4.5x9. The completed pieces are then chosen by the long



Деворнинг ташки бурчагида дандонали форси услубнинг кулланиши.

side of the piece and cleaned in clear water by laying a piece of gauze on a straight line indicated with the item's size. There is a 1-1.5 cm seam put in between them. Rubber bands, which are cut from old automobile cameras, are inserted into the cracks between the tiles before they are tied. The rubber tape's width is often the same as the tile seam, which is between one and 1.5 centimeters. The rationale behind attaching these tapes to the tile seam is that the seam is beautiful. Following the grape harvesting process, the Takhbin grapes are encircled by mesh fencing and sprayed with water. A 50 centimeter paper strip divides the tooth row. The mixture is then poured, first liquid and then darker putty, measuring 6-7 cm thick. The roof's tile board is removed from the roof when the slurry has dried. It is simple to manually remove the rubber bands on the raised batten's seams out from between the tiles. Depending on the thickness of the rubber, the seam behind the tapes is 2-3 mm within the tile's surface when they are removed, and the grout does not spill over the terracotta tile's surface when it is poured. [3]

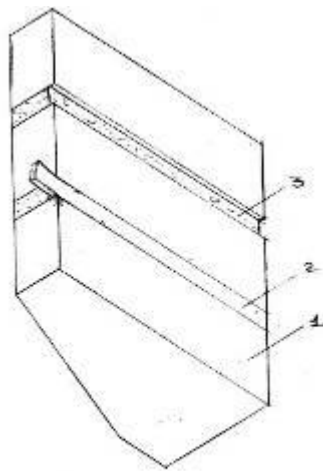
Craftsmen frequently use pre-made metal corners, couple two straight boards to 900, or cover the side with a broad board even when it is pushed to make it simpler to pour ganch into the seam of corner boards.

A colorful ribbon, one centimeter broad, is constructed from the interior of the tiles in certain monuments (the walls of the Ishratkhana, the cells of the Sherdar madrasa). It works by cutting tiny rubber tapes to fit under the tiles at the appropriate width. After dialing a row of tiles for this decoration in Takhbin, rubber tapes are applied to the seam location, and then tapes containing tiles are applied on top of them. Next, the tiles in the second row are dialed. After picking, water is sprinkled and the dough is poured. [2]

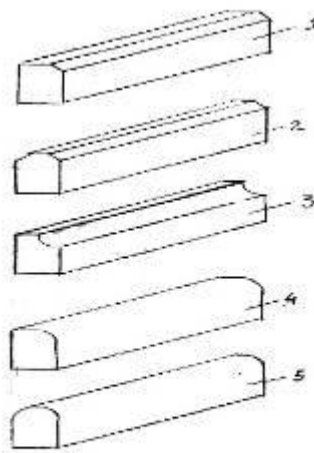
**1.2. Dabbling done in a Persian manner is referred to as Persian style.** In this instance, the two teeth's surface corners, which are oriented vertically and horizontally, need to be cut exactly at 450 to make the two teeth seem as one whole when they converge. The wall often extends on both sides of the structure and is fastened to the outside corner of the wall. The teeth in the upper corner will be divided into three sections in this instance. [1] is positioned.

**1.3. Method for preparing passengers** One of the architectural embellishments seen on monuments is pax. It is mostly utilized in tile and brickwork. Pax is composed of regular brick or terracotta and measures 25 cm long by 10–12 cm broad by 5-5.5 cm thick. When a piece of pax is sliced longitudinally, it may be classified into many varieties, such as tulip, nova, and so on. [3]

**2.1. Waxing and tile installation** As previously said, the tile surrounds the tile on the wall from four sides. On the chosen plane, the tooth and blade positions are calculated and sketched. The placement of the teeth set beneath the tile must be closely inspected. The calculated amount is split by two in the event that the structure gradually descends a few millimeters. This type of labor is known as "tuning" in repair. Using a trowel, level the tooth's surface by making the designated mark with a rasp. Using a shovel, draw the two sides and the top and lower markings. Set the tooth's face and the pakh that passes through the two sides. A smooth line is rasped from the inside of the tile to its perimeter at a depth of 2-3 cm. The inner side of the placed tile and the tile itself, that is, the surface on which the tile is installed, are both carefully leveled. "Obrez" is the space that is two to three millimeters left from the tile installation line. [3]



1-Дандовали;  
2-Резиновая лента;  
3-Табла коринмаси.



Нахлест контин турлари  
1-Тутри пax;  
2-буртали пax;  
3-1 тона пax;  
4,5-Йули пax.



2.2. Attaching the wall-mounted tile board Prior to putting in the tile board, measurements are taken of the regions of the tile boards that fall in the middle and those that are positioned on the two sides along the lines drawn from the inside of the inserted panel or dent. If there are old tiles still intact on the upper wall, additional care is given to ensuring that the tiles arranged vertically on the tile board match their row. Measure markings are made on both sides of the foundation beneath each row of tile boards before they are fixed. Subsequently, the tile board is secured on both sides in accordance with the lines adjacent to and below it. They must be installed correctly and precisely with great care. Otherwise, the quality of the work will be impaired and it will be incorrect until the end, after gradually increasing

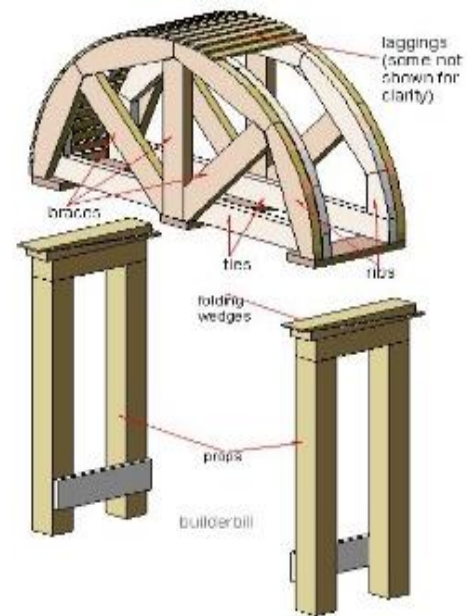
All of the earlier work must be destroyed and restarted by the pax teeth that is inserted in the Ravok input. In [3] Four arch lingas are constructed of wood, based on the shape of the arch formed on this straight wall. To build a



takhbin for the roof tiling, two of the ready lingas are utilized. The width of the archway is measured from its two straight walls once the tahbin has been made. Two lingas of the archway are separated from their sides and joined to one another by a hole. The beginning of the linga circle is under this dimension. After that, the two lingas are made stronger by being nailed with thin planks. Within the inner mesh of the arch, one of the constructed linga is securely mounted on the tile wall's surface. In this instance, the top portion of the placed linga is in a different plane from the outside corner of the teeth that are selected around the wall's tiling work. [5]



Four arch lingas built of wood may be identified by their shape, which is the arch formed on this straight wall. Making a takhbin for the roof tiling requires two of the ready lingas. The two lingas of the archway are coupled with each other through a hole once the tahbin is made. They are separated from its sides. Under the beginning of the linga circle is where this dimension is located. Nailed with narrow boards, the two lingas are then reinforced. Within the inner arch mesh, one of the created linga is securely fastened on the tile wall's surface. The top portion of the placed linga is on a different plane from the outside corner of the tiling around the tiling on the wall in this instance.[2] The inner surface of the arch is in touch with the right sidewalls of the second linga.



The supporting board is now positioned beneath the ground using a single brick before the lingas are installed on the wall. Upon completion, one-sided wooden pegs are affixed beneath it to facilitate its effortless removal from the location. With the use of wooden pegs, the wooden pillars holding up the linga are fixed to one another. To ensure that the mesh remains stationary, the placed lingas are fastened to one another using a wooden rail.

The two side walls that are straight and have tile put all the way around them are crucial when it comes to tile work on the porch. Symmetric finishing should be applied to the section with the correct direction dialed up to the bottom of the arch. Taking measurements at four corners should yield the same height and breadth for the straight wall on the two sides beneath the arch. [3]

Next, measure across the lingas to get the distance from the start of the arch circle to the edge of the tiling pattern distributed on the working design. Four angles are measured independently in this instance. Additionally, each side's lingas are measured independently to determine the arch's breadth.

There are tiles for these dimensions. As far as feasible, the number of rows of tiles allocated to the linga mesh in the dimensions should match the numbers in the operational project. If not, traveling to Nash will disrupt the tile pattern.

A net of bakhsh is stretched across the tahbin's surface based on the size of the bakhsh in this distribution. [2]

After the calculations and measurements mentioned above, tiles can be laid in the tahbin in accordance with the tile-laying guidelines. Small porches should try to have as much of a single side as feasible when it comes to dividing the tile board. because the wall is fitted with the tile board vertically. The tile board is connected to the porch by fitting it to the porch, which is the reverse of what happens. This means that, naturally, half of the tile's weight rests on the tile below it and the other half rests on the master installer's hands. [6] To get around this, when installing tile boards on arches up to three meters wide, the two sides of the upper part of the flat board should be installed equal to the upper surface of the lingas. Then, a thick board or piece of flat wood should be thrown across the boards thrown into the basin beneath the feet and attached to the lingas above, in place of pulling the rajja string as mentioned above. joist on the board While the raj is the basis for installing tile boards on large arches, you may also employ the above method's hurdles in this operation. Only for this reason is a 1-2-meter gas beam crushed on its face following the meticulous installation of the first tile board and it is strengthened with a stud. The second tile board is then put such that it touches the gas burner. Soft wires are inserted between the ganch of the tile board that is being prepared for the roof, either from the top or both edges, and then the ganch of the

false method is attached. In this instance, the wire between the two tile boards is wrapped around a nail that has been driven into the wall from the middle of the two tiles. When preparing the tile board for the archway, it is often best to make it shorter (30–40 cm) and wider (1 meter). If the wire is removed, it will also be easier to attach the tile board in its proper location. [5]

2.3. Tile work on the interior of the dome. The decorations given to the cultural monuments are not only on their exterior, but also on the interior of the building. The domes inside the buildings are decorated in different styles, i.e. "balkhi", "iraqi", "round" girix and other types of decoration styles. . Especially in the bowls on the brick ribs, the combination of tiling works is often found in arches and domes of Bukhara monuments. We can see the tiling of the interior of the dome in Samarkand, in the complex of the view of the dome in the interior of the shrine of Qusam ibn Abbas mausoleum in the Shahi-Zinda Shahi-Zinda complex. The internal domes of the Usto Ali, Shadi Mulk, and Qusam ibn Abbas mausoleums are a few examples of these structures. The arches and muqarnas at the corners of the four-cornered chamber gave the walls of the structure an octagonal look, which is seen in the decorating of these domes. At the start of the dome, the shape changes to a circle.\*[4,5]



The primary tile ornamentation in these domes are in the "Linga Jakar" style, which was created in Khanqor during ancient times. The dome's circular is frequently split into eight sections in this design. The arched or irregular pieces of ganch that give the dome its shape are put on the wall of the dome, beginning at the point where its round begins, from the corners that divide these sections.

In conclusion, the study of architectural features found in historical and ancient architectural monuments, along with a scientific examination of their appropriate application for contemporary needs, will expose the technologies and useful solutions behind wall decorations such as tiling or brickwork.

## References

1. Уралов А.С., Маматмусаев Т.Ш. Архитектурaвий шаклларни уйғун-лаштириш ва безаш.-Тошкент. 2017.
2. Уралов А.С., Ҳаққулов А.Ғ., Абдураимов Ш.М. Архитектура ёдгор-ликларини таъмирлаш ва қайта тиклаш тамойиллари.-Самарқанд. 2020.
3. Ҳаққулов А. Тарихий ёдгорликларни таъмирлаш. Т. 1983
4. Ҳаққулов А. Таъмир санъати. Т., 1991
5. Ҳаққулов А.Ғ. Меъморий таъмир ва кошинбурриш санъати фидойиси.-Самарқанд.2016.
6. Axmedov M.Q. "O'rta Osiyo me'morchiligi tarixi", 34-bet. Toshkent. "O'zbekiston" nashriyoti, 1995y